Summary

Final
Wetlands Report
SR 104 EIS: US 101 to Kingston

Summary

Purpose and Need

This environmental impact statement evaluates a set of alternatives that will be used to create a twenty-year plan and stakeholder-generated vision for the future of State Route (SR) 104. This analysis will include direct, indirect, secondary, and cumulative impacts that may result from growth allowed or accelerated by SR 104 improvements.

It is important to recognize that this is a corridor-level study that focuses on major transportation elements, such as mode and alignment. Given the limited funding available for highway improvement projects, it is anticipated that any improvements recommended as a result of this study will be constructed in incremental segments over a long period of time. Therefore, the study does not focus on specific design details or precise footprints, but examines the potential environmental impacts of any proposed action in more general terms. Additional environmental review, such as an environmental assessment or categorical exclusion, would be conducted, as necessary, for individual projects as funding becomes available.

The need — is to provide a multi-modal transportation linkage to the Kitsap and Olympic Peninsulas that enables safe, efficient, and economical movement of people and goods.

The purpose — is to do so in a manner that respects and provides for the competing needs: preserving scenic and natural beauty, the historic and rural character of the area, the current quality of life for both residents and users, and the integrity of the natural environment.

Alternatives

Corridor Overview

State Route 104 is located on the west side of Puget Sound in northern Jefferson and Kitsap Counties. The route begins at US Highway 101 near the tip of Discovery Bay and extends eastward, across the base of the Quimper Peninsula to the Hood Canal Floating Bridge to Kingston. The route crosses into Kitsap County in the center of Hood Canal and continues east, around Port Gamble Bay, across the northern Kitsap Peninsula to the community of Kingston, ending at the Washington State Ferries terminal.

The 24.5-mile route has been designated as a highway of statewide significance and serves as the primary link for freight, tourist, and commuter traffic between the northern Olympic Peninsula and greater Puget Sound. The route breaks naturally into five segments: the western Quimper Peninsula, the eastern Quimper Peninsula, the Hood Canal Floating Bridge, the Port Gamble Bay area, and greater Kingston.

Related Actions

Early in the planning process it was recognized that the Department of Transportation has several projects funded for construction or design within the next six years on SR 104. Since the goal of this study is to develop a twenty-year plan for the route, and most of these projects are planned to be completed within the next six years, it was agreed that these projects should be considered *related actions* and, for the purposes of this study,

treated as if they already exist. These projects are subject to separate and independent project-specific environmental review.

The Alternatives

The 24.5-mile route is divided into five segments based on terrain, traffic, and traffic volumes. A number of the alternatives are common throughout two or more highway segments, with variations designed to fit the characteristics and meet the needs of each segment along the route.

This complex set of alternatives is organized first by highway segment, numbered 1, 2, 3, 4, and 5, then within each segment by the nature of the action, with the letters A, B, C, D, E, and VA. Thus, the no-build alternative, labeled A, is examined in all five roadway segments as Alternatives 1A, 2A, 3A, 4A, and 5A. The transportation demand management (TDM) alternative, labeled B, also is analyzed in all five roadway segments, as Alternatives 1B, 2B, 3B, 4B, and 5B. The TDM alternative includes park-and-ride lots, a vanpool/carpool program, express transit, and a medical transportation management association. The full suite of alternatives is listed below.

- Segment 1—Western Quimper Peninsula

  Alternative 1A – No build
  Alternative 1B – TDM
  Alternative 1C – Four-lane widening
  Alternative 1VA – Continuous three-lane widening
  Option 1VA – Interrupted three-lane widening

- Segment 2—Eastern Quimper Peninsula

  Alternative 2A – No build
  Alternative 2B – TDM
  Alternative 2C – Four-lane widening
  Alternative 2VA – Continuous three-lane widening

- Segment 3—Hood Canal floating bridge

  Alternative 3A – No build
  Alternative 3B – TDM
  Alternative 3C – Four-lane bridge widening

- Segment 4—Port Gamble Bay area

  Alternative 4A – No build
  Alternative 4B – TDM
  Alternative 4C – Two-lane north bypass
  Alternative 4D – Two-lane south bypass
  Alternative 4VA – Upgrade existing two-lane roadway

- Segment 5—Greater Kingston

  Alternative 5A – No build
  Alternative 5B – TDM
  Alternative 5C – Four-lane widening
  Alternative 5D – Grade separation
  Alternative 5E – Short tunnel.

Methodology and Study Coordination

Existing information was gathered from various sources to characterize baseline conditions. Field reconnaissance was then performed to identify wetlands along the project corridor and to determine whether they are regulated by state and federal agencies. The information collected was used for mapping, classification, and functional analyses of identified wetlands.

For the purposes of this report, the *project corridor* is defined as the area to be disturbed by project reconstruction and is generally the area within 100 feet of the edge of pavement on the existing alignment. The alternative bypass routes in Segment 4, Alternatives 4C and 4D, are not located along existing roadways, and their alignments are approximate. The *project area* includes the wetland areas immediately adjacent to the project corridor that have the potential to be affected by actions within the project corridor. The *project vicinity* is the regional area, which influences the wetland conditions within the project area and the types of wetlands that are found within those areas.

Field Reconnaissance

Field conditions were evaluated by walking and driving along SR 104 to identify potential wetlands within the project corridor.

For Alternatives 4C and 4D, the alternative bypass routes in Segment 4, the proposed centerlines for the bypass alignments were not marked in the field at the time the onsite reconnaissance was conducted. Project biologists gained access to portions of these alternative routes via logging roads, based on their best estimates of the location of the proposed centerline. It is estimated that 50 percent of the Alternative 4C alignment and 20 percent of the Alternative 4D alignment were inspected in the field. The remaining areas along these alignments were inaccessible, and direct observations of existing conditions could not be obtained. For these inaccessible portions of the bypass routes, wetland determinations were made using existing information.

Wetland Determination

Wetland determinations for the project corridor were performed in accordance with the *Washington State Wetlands Identification and Delineation Manual* (Ecology 1997) and the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987). The 1987 manual's three-parameter approach for determining the presence of wetlands relies on the occurrence and distribution of field indicators for hydrophytic (wetland) vegetation, hydric soils, and hydrology. The routine determination method was followed to perform these wetland determinations (Environmental Laboratory 1987) for this EIS project.

Wetland Mapping

Proposed cut and fill lines for road modification were provided on aerial photographs. These photographs, along with topographic maps, National Wetlands Inventory maps, and on-site inspections were used to map wetland in the project vicinity.

Wetland Functional Assessment

Wetland functional assessments in this study were made according to the *Wetland Functions Characterization Tool for Linear Projects* (WSDOT 2000a). This qualitative method generally identifies whether the wetland is either *likely to provide* or *not likely to provide* the wetland functions and values based its hydrogeomorphic type.

Affected Environment

Project Setting

A total of 66 wetlands have been identified in the project corridor. Beginning in Segment 1, each wetland was numbered in sequential order using an aquatic resource (AR) number. In addition to wetlands, the project area has numerous freshwater and marine resources.

The project area is largely contained on two land masses that drain to several water bodies. Segments 1 and 2 are located on the Olympic Peninsula and drain primarily to the Strait of Juan de Fuca and Hood Canal. Segment 3, which contains the Hood Canal Bridge, drains directly to Hood Canal. Segments 4 and 5 are located on the Kitsap Peninsula and drain to Hood Canal, Port Gamble, and Puget Sound.

Wetland Descriptions

Segment 1 – West Quimper Peninsula

A total of 16 wetlands are found in this segment (AR 1 through AR 6/7 and AR 9 through AR 18). Most of these wetlands are depressional outflow systems, with the exception of one depressional closed system and one riverine flow-through system. The wetland sizes vary from less than one acre (AR 18) to greater than 20 acres (AR 6/7).

This segment is located in water resource inventory area (WRIA) 17, and wetlands in this segment drain to the Snow Creek, Chimacum Creek, Tarboo Creek, Ludlow Creek, and Thorndyke Creek watersheds. Tarboo Creek is the only major stream located within the project corridor in this segment.

Segment 2 – East Quimper Peninsula

A total of 19 wetlands are found in this segment (AR 19 through AR 36 and AR 40). The wetlands within this segment include depressional outflow and closed systems, riverine flow-through systems, slope systems, and tidal fringe systems. The wetland sizes vary from less than one acre (AR 20) to greater than 100 acres (AR 24).

This segment is located in WRIA 17 and drains to the Shine Creek watershed (WDF 1975). This watershed is drained primarily by a series of small streams discharging directly into the Squamish Harbor on Hood Canal. The roadway, which follows an alignment ranging between 300 and 1,300 feet north of the shoreline, is elevated on a terrace ranging between 60 and 160 feet above the shoreline.

Segment 3 – Hood Canal Floating Bridge

A total of four wetlands are found in this segment (AR 37, AR 38, AR 39, and AR 41). Wetlands within this segment are depressional closed systems and tidal fringe systems. The wetland sizes vary from less than one acre (AR 39) to greater than 50 acres (AR 41).

This segment drains entirely to marine waters of the Hood Canal. There are no freshwater resources in this segment. Hood Canal is a large fjord separated from Puget Sound by the Kitsap Peninsula (WSDOT 2000b). The north end of Hood Canal (including the Hood Canal Bridge) is subject to extreme weather and environmental fluctuations, including tidal fluctuations of up to 16.5 feet, strong winds, and open-ocean waves.

Segment 4 – Port Gamble Bay Area

A total of 18 wetlands are found in this segment (AR 43 through AR 56 and AR 65 through AR 68). Most wetlands within this segment consist of depressional outflow or closed systems, riverine flow-through systems, and tidal fringe systems. The wetland sizes vary from less than one acre (AR 65) to greater than 200 acres (AR 56).

This segment is located in the Hood Canal and Port Gamble Bay drainage area. The project corridor crosses several short, steep, unnamed drainages along Hood Canal and western Port Gamble Bay for the first 4 miles of this segment, as well as one named system, Todhunter Creek.

Segment 5 – Greater Kingston

A total of nine wetlands are found in this segment (AR 57 through AR 64 and AR 70). Most wetlands within this segment are dominated by depressional outflow or closed systems. The wetland sizes vary from less than one acre (AR 61) to greater than 30 acres (AR 59).

This segment is located in WRIA 15 and includes the Miller Lake, Grovers Creek, and Carpenter Lake watersheds. The corridor crosses several named and unnamed drainages, including a small basin that drains to Miller Lake and ultimately to Port Gamble Bay. Within the Grovers Creek subbasin the corridor crosses Grovers Creek and its tributary, which drain to Miller Bay and Port Madison on Puget Sound. Near the town of Kingston, the corridor crosses Carpenter Creek and an unnamed tributary, which flows to Carpenter Lake and Appletree Cove

Wetland Function Assessment

The 66 wetlands in the project corridor were placed into four hydrogeomorphic categories for the purposes of the function assessment, because wetlands with similar hydrogeomorphic attributes have similar functions.

Depressional Wetlands

Depressional outflow and closed wetlands of all sizes are abundant throughout the project area. Most notable are the large wetland systems associated with Chimacum Creek (AR 6/7), Shine Creek (AR 24), and Grovers Creek (AR 59). Wetlands within this functional group are topographic depressions (low areas) either with no outlet or with constrained outlets (e.g., berms or culverts).

These wetlands provide high levels of flood attenuation; short- and long-term surface water storage; sediment, nutrient, and toxicant removal; organic matter export; and food chain support.

Riverine Wetlands

Riverine flow-through wetlands are found in Segments 1, 2, 4, and 5 but are a dominant feature in Segments 2 and 4. Riverine flow-through wetlands occurring in the SR 104 corridor have a dominant forested component, a high proportion of native plants relative to the surrounding disturbed communities, and multiple vegetation layers. Hydrologic and water quality attributes include riverine hydrology, intact soil horizons, and a shallow ground water table.

These wetlands have the potential to provide flood attenuation; short- and long-term surface water storage; and sediment, nutrient, and toxicant removal; however these wetlands are not as proficient as depressional systems for these functions. These systems play a very important role in bank stabilization and downstream erosion.

Slope Wetlands

Slope wetlands are rare in the watersheds crossed by the SR 104 project corridor. Only one slope wetland was identified (AR 31). This wetland, occurring in Segment 2, contains forested buffers with moderate levels of structural diversity. This wetland has a high proportion of native plants compared to surrounding plant communities, and is partially surrounded by moderate-sized buffers. Hydrology in this wetland is provided by shallow ground water seeps. This slope wetland provides ground water discharge and sediment, nutrient, and toxicant removal.

Tidal Fringe Wetlands

Tidal fringe wetlands are found along marine shorelines where the water is greater than 6 feet deep and more than 20 acres in water body size. These areas are found along the Hood Canal Bridge and Port Gamble Bay shorelines. Wetland functions within these areas are limited due to the narrow vegetation bands that are present. An important function of these systems is shoreline stabilization. They are able to dissipate wave action generated by storms and tides. These wetlands have the potential to provide generally suitable habitat for invertebrates, anadromous fishes, resident fishes, birds, and mammals. Native plant richness and organic production are also associated with these areas.

Environmental Consequences and Mitigation

Construction Impacts

Construction Impacts Common to All Segments

The following impacts arising from construction activities may occur in wetlands in the project area:

- Permanent and temporary placement of gravel fill in wetlands for construction machinery access may result in increased sediment loading and turbidity.
- Grading and filling activities might allow sediment-laden runoff to drain into adjacent wetlands and streams.
- Permanent or temporary loss of vegetation in the riparian zone of streams may affect fish habitat by increasing bank erosion, reducing food sources such as insects, increasing stream temperatures due to loss of shade, and decreasing recruitment of large woody debris.
- Accidental spills of fuel, oils, chemicals, and concrete leachate used during construction may occur. The potential impacts of an accidental spill of fuel or other chemicals are highly dependent on the effectiveness of containment and cleanup procedures.
- Elimination of vegetation in both upland and wetland areas would result in losses of breeding and foraging habitat for wildlife in the vicinity of the project corridor.
- Compaction of soils may occur during construction activities, potentially contributing to a long-term decrease in soil permeability, infiltration, and water storage capacity. Changes in the permeability, infiltration, and storage capacity of surface soils may result in increased stormwater runoff and subsequent increases in peak streamflow and decreased ground water recharge.

Segment 1 – West Quimper Peninsula

Alternative 1A—No Action

Because no construction would occur under the no-action alternative, no construction impacts on wetlands would be expected

Alternative 1B—Transportation Demand Management

Two upgraded park-and-ride lots are planned for this segment under this alternative: the SR 104/Center Road park-and-ride in the vicinity of milepost 4.2, and the SR 104/Beaver Valley Road park-and-ride in the vicinity of milepost 8.7. Construction of the park-and-ride lots may result in loss of Category I and II wetlands.

Alternative 1C—Four-Lane Widening

This alternative would affect 14 wetlands in Segment 1. The alternative would result in the loss of 24.55 acres of wetlands, including the loss of 14.95 acres of Category I forested wetlands. Additional impacts would include 7.51 acres of Category II wetlands, 1.72 acres of Category III wetlands, and 0.37 acres of Category IV wetlands. The Chimacum Creek watershed would incur the most extensive wetland impacts, totaling 14.95 acres in AR 6/7. Most of the wetlands that would be affected in Segment 1 are depressional outflow and closed systems.

Alternative 1VA—Continuous Three-Lane Widening

Alternative 1VA would affect 8.67 acres of wetland. The Ludlow Creek watershed would incur the most extensive wetland impacts, totaling 1.46 acres. Within Segment 1, this alternative would result in the least amount of wetland impact.

Option 1VA—Interrupted Three-Lane Widening

Option 1VA would affect a total of 8.77 acres of wetlands. The Ludlow Creek watershed would incur the greatest amount of wetland impact (1.58 acres). Total wetland acreage impacts would be slightly higher than under Alternative 1VA.

Segment 2 – East Quimper Peninsula

Alternative 2A — No Action

Because no construction would occur under the no-action alternative, no construction impacts on wetlands would be expected.

Alternative 2B — Transportation Demand Management

Improvements at the South Point Road park-and-ride would have the potential to disturb Category I wetlands that support nesting bald eagles and great blue herons and provides spawning and rearing habitat for searun cutthroat trout and coho salmon. Potential fill in this wetland and its surrounding upland buffer for construction of a park-and-ride lot would result in adverse effects on wildlife and fisheries resources.

Alternative 2C — Four-Lane Widening

A total of 19 wetlands would be affected by this alternative, which would result in the loss of 6.11 acres of wetland. Alternative 2C would result in the loss of 0.15 acres of Category I wetlands, 1.80 acres of Category II wetlands, and 4.10 acres of Category III wetlands. Most wetlands within this segment are forested and are classified as either depressional or riverine flow-through.

Alternative 2VA—Continuous Three-Lane Widening

A total of 16 wetlands would be affected by this alternative, which would result in the loss of 4.80 acres of wetlands. Alternative 2VA would result in the loss of 0.10 acres of Category I wetlands, 1.66 acres of Category II wetlands, and 3.04 acres of Category III wetlands.

Segment 3 – Hood Canal Floating Bridge

Within Segment 3, there are no expected areas of wetland fill resulting from roadway construction. However, within this segment, other construction activities may affect adjacent wetlands.

Alternative 3A—No Action

Because no construction would occur under the no-action alternative, no construction impacts on wetlands would be expected.

Alternative 3B—Transportation Demand Management

The Paradise Bay Road park-and-ride (milepost 13.76) would be located at the site of an existing viewpoint and would require minimal disturbance for development; therefore, no adverse impacts on wetlands are expected.

Alternative 3C—Four-Lane Bridge Widening

Widening the Hood Canal floating bridge may affect an area greater than one acre of eelgrass beds (AR 41) through changes in water quality. Bridge widening would require some demolition of existing roadway, the installation of new forms, and pouring of concrete. Due to its light requirements, eelgrass and kelp beds can be adversely affected by water turbidity and chemical inputs originating from accidental spill of pollutants

Segment 4 – Port Gamble Bay Area

Alternative 4A—No Action

Because no construction would occur under the no-action alternative, no construction impacts on wetlands would be expected.

Alternative 4B—Transportation Demand Management

One park-and-ride lot is planned for this segment, the SR 3/SR 104 park-and-ride at milepost 15.5. No construction-related impact on wetlands is expected.

Alternative 4C—Two-Lane Northern Bypass

A total of five wetlands would be affected by this alternative, which would result in the loss of 2.09 acres. Based on field observation and review of existing data, Alternative 4C would result in the loss of 1.66 acres of Category II wetland and 0.42 acres of Category III wetland. These forested and scrub-shrub wetlands are located within the Port Gamble watershed.

Alternative 4D—Two-Lane Southern Bypass

Based on a preliminary reconnaissance, this alternative would result in the loss of 0.17 acres of Category II forested/scrub-shrub wetland (AR 52) associated with Todhunter Creek. Based on National Wetlands Inventory maps, no other wetlands are mapped within the project area of this route (USFWS 1973e). Not all portions of the bypass were accessible for field investigation, and the locations of the wetland and estimate of impacts are approximate.

Alternative 4VA—Upgrade Existing Two-Lane Roadway

A total of 13 wetlands would be affected by this alternative, which would result in the loss of 1.49 acres of wetland areas. Alternative 4VA would result in the loss of 0.84 acres of Category I wetlands, 0.28 acres of Category II wetland, and 0.37 acres of Category III wetland. The Port Gamble watershed would incur the greatest amount of wetland impact, totaling 1.06 acres.

Segment 5 – Greater Kingston

Alternative 5A—No Action

The no-action alternative in Segment 5 would result in the same impacts on wetlands as described for Segment 4.

Alternative 5B—Transportation Demand Management

This alternative includes the potential expansion of seven park-and-ride lots in the Kingston vicinity: the Kountry Korner park-and-ride in the vicinity of milepost 22 and the downtown Kingston, Bayside Community Church, Poulsbo Junction, Christ Memorial Church, Suquamish Community Church, and Agate Pass park-and-ride lots.

Construction of the Kountry Korner park-and-ride may result in the loss of a scrub-shrub wetland (AR 58) located northwest of the intersection. In addition, an open-water wetland (AR 70) was identified northeast of the Albertson's store parking lot. These wetlands are located in the headwaters of Grovers Creek and provide important water quality, stormwater control, and nutrient transport functions for downstream reaches of the system. Impacts resulting from filling of these wetlands would reduce these important functions. Because no aquatic resources have been identified adjacent to the remaining park-and-ride lots, no construction-related impacts on wetlands are expected to result from these Kingston vicinity park-and-ride projects.

Alternative 5C—Four-Lane Widening

A total of 8 wetlands would be affected by this alternative, which would result in the loss of 1.88 acres. Alternative 5C would result in the loss of 1.46 acres of Category II wetlands and 0.42 acres of Category IV wetlands. The Miller Bay/Grovers Creek watershed would incur the greatest amount of wetland impact, totaling 0.89 acres.

Alternative 5D—Kingston Grade Separation

No construction-related impacts are expected to result from this alternative in this segment. Therefore no impacts on wetlands are expected.

Alternative 5E—Short Tunnel

No construction-related impacts are expected to result from this alternative in this segment. Therefore no impacts on wetlands are expected.

Construction Mitigation Measures

Recommended mitigation for construction impacts in wetlands is based on a hierarchy of avoiding, minimizing, or compensating for unavoidable impacts. Avoidance and minimization modifications considered during design development included using multiple culverts, using retaining walls to limit roadway width, locating roadside pullouts in upland areas, and realigning the roadway away from wetlands. As part of the permitting process, compensatory mitigation is required when avoidance or minimization is infeasible through project design. Where impacts are unavoidable, mitigation may be provided by creating, enhancing, or restoring wetland habitat of a similar type and wetland functions lost.

Segment 1 – West Quimper Peninsula

The following section describes mitigation measures specific to each segment and alternative.

Alternative 1A—No Action

Because no construction would occur under this alternative, no mitigation is required.

Alternative 1B—Transportation Demand Management

Within this alternative, two new park-and-ride lots, SR 104/Center Road and SR 104/Beaver Valley Road are proposed within Segment 1. Options to avoid impacts on a wetland (AR 6/7) adjacent to Center Road and SR 104 would involve building the new parking facility in upland areas, which are located to the northeast and southeast quadrant of the intersection.

The SR 104/Beaver Valley Road park-and-ride lot should avoid AR 18, which is located in the northwest and southwest quadrant of the intersection. Locations east of the visitor center, on the opposite side of Center Road, are upland areas and would be a more suitable location.

Alternative 1C—Four-Lane Widening

This alternative has the highest loss of wetland acreage compared to any other segment alternative, including impacts on AR 6/7, a Category I wetland, which is located in the headwaters of Chimacum Creek. Recommended measures to minimize impacts on this system include avoiding widening into this wetland due to its high function and value; minimizing the limits of construction to a maximum of 75 feet from existing pavement on each side of the roadway to reduce impacts associated with the on- and off-ramps; and using a retaining wall to minimize the area of impact.

Alternative 1VA—Continuous Three-Lane Widening

Alternative 1VA is the alternative with the least wetland impacts in Segment 1. Both Alternative 1C and Option 1VA require more wetland fill. Construction mitigation measures for this alternative would be the same as those described for Alternative 1C.

Option 1VA – Interrupted Three-Lane Widening

Construction mitigation measures for this alternative would be the same as those described for Alternative 1C.

Segment 2 – East Quimper Peninsula

Alternative 2A—No Action

Construction mitigation measures for this alternative would be the same as those described for Alternative 1A.

Alternative 2B—Transportation Demand Management

A new park-and-ride lot location at the intersection of SR 104 and South Point Road in the vicinity of the fire station may potentially affect a large Category I wetland (AR 24).

In addition to the general mitigation measures described previously, the new lot should be sited to avoid AR 24 and its buffer to the greatest extent practicable. Upland areas northeast of South Point road or adjacent to the fire station should be considered.

Alternative 2C—Four-Lane Widening

Reconfiguration of the intersection of SR 104/South Point Road, construction of a new park-and-ride, and construction of an access road should avoid impacts on the Shine Creek wetland (AR 24) and its riparian buffer. The use of retaining walls along steep slopes should be considered to minimize wetland and buffer impacts.

Road widening at the stream crossing should rectify ongoing erosion and stormwater impacts in lower Shine Creek resulting from the existing roadway configuration.

Alternative 2VA—Continuous Three-Lane Widening

Construction mitigation measures for this alternative would be similar to those described for Alternative 2C.

Segment 3 – Hood Canal Floating Bridge

Alternative 3A—No Action

Because no construction would occur under this alternative, no mitigation is required.

Alternative 3B—Transportation Demand Management

Because no construction would occur under this alternative, no mitigation is required.

Alternative 3C—Four-Lane Bridge Widening

The primary potential impacts associated with this alternative are water quality effects on aquatic habitats and estuarine shorelines. The project would develop a temporary erosion and sediment control (TESC) plan to reduce impacts associated with erosion of disturbed soils from staging areas, work bridge access, and other disturbed construction areas.

Alternative 4A—No Action

Construction mitigation measures for this alternative would be the same as those described for Alternative 1A.

Alternative 4B—Transportation Demand Management

Construction related work in this area may affect two stormwater collection areas located between the eastbound and westbound lanes of the Hood Canal Bridge. Best management practices compliant with contractor specifications should be installed to detain and treat water if these stormwater collection areas are inoperable due to construction related practices.

Alternative 4C—Two-Lane Northern Bypass

Based on existing data and field reconnaissance, the greatest amount of wetland loss would occur in this alternative within Segment 4. The Port Gamble watershed would incur the greatest wetland impacts; therefore all efforts must be taken to minimize impacts, or to compensate for the wetland losses within this watershed. Recommended

mitigation for impacts on AR 46 and AR 47 includes relocating the intersection of the north bypass with SR 104 to avoid new culvert crossings; installing a bridge at this location to avoid the use of additional culverts; or ensuring the narrowest stream crossing possible that provides fish passage and preserves riparian habitat.

Alternative 4D—Two-Lane Southern Bypass

Based on existing data and field reconnaissance, this alternative would cause the least wetlands impact within Segment 4.

Recommendations to minimize impacts on Todhunter Creek (AR 52) include modifying the design of the intersection of the southern bypass with SR 104 to eliminate the need for a culvert crossing, or ensuring the narrowest crossing possible to preserve riparian habitat.

Alternative 4VA—Upgrade Existing Two-Lane Roadway

Realignment of this route to avoid wetlands would be difficult due to the proximity of residential properties along the roadway. Steep slopes adjacent to Port Gamble Bay may require retaining walls, in order to minimize impacts on the shoreline and drainage features.

Segment 5 – Greater Kingston

Alternative 5A—No Action

Construction mitigation measures for this alternative would be the same as those described for Alternative 1A.

Alternative 5B—Transportation Demand Management

Expansion of the Kountry Korner park-and-ride lot would avoid two wetlands (AR 58 and AR 70) in close proximity to the site.

Alternative 5C—Four-Lane Widening

Wetlands in this segment are located in close proximity to the roadway, which makes avoiding them particularly difficult. Mitigation measures for impacts on wetlands under Alternative 5C include replacing functions lost primarily in depressional wetlands. Due to the flatter topography in this area, suitable sites exist along this corridor for wetland enhancement and creation.

Alternative 5D—Kingston Grade Separation

Recommended mitigation for construction impacts on wetlands in Alternative 5D would involve avoiding, minimizing, and compensating for unavoidable impacts.

Alternative 5E—Short Tunnel

Recommended mitigation for construction impacts on wetlands in Alternative 5E would involve avoiding, minimizing, and compensating for unavoidable impacts.

Operational Impacts and Mitigation Measures

Impacts on wetlands resulting from operation of the SR 104 project that are common to all segments include the following:

- Increased fragmentation of wetland habitat along the roadway
- Reduced value of wetlands near the roadway and displacement of wildlife from wetlands adjacent to the roadway
- Colonization of disturbed wetlands by noxious weeds
- Increases in stormwater runoff containing pollutants and the resulting decreases in wetland water quality.

Segment 1 – West Quimper Peninsula

Alternative 1A—No Action

In its current condition, the existing SR 104 corridor fragments wetland habitats near the road corridor. Under the no-action alternative, this impact would remain, but no new wetlands would be disturbed or reduced in value.

Alternative 1B—Transportation Demand Management

If transportation demand management locations were adjacent to wetland areas, routine landscaping may introduce more noxious plant species, and increased vehicle noise may displace wildlife. Any construction activities for new or expanded park–and-ride lots would include stormwater treatment and detention facilities for parked vehicles. As a result, new and existing surfaces would be treated, thereby minimizing wetland water quality or quantity impacts.

Alternative 1C—Four-Lane Widening

Loss of riparian forest associated with Tarboo Creek may affect wetland wildlife through the loss of cover and food sources, and would also affect wetland functions through the loss of organic matter accumulation. While riparian vegetation may be planted as mitigation for project impacts at the project site and within other portions of the stream system, the benefits of these plantings would take several years to realize.

Due to the proposed new stormwater treatment and detention measures, Alternative 1C is expected to result in long-term benefits to wetlands by reducing water quality and quantity impacts.

Alternative 1VA—Continuous Three-Lane Widening

Operational impacts under this alternative would be similar to those described for Alternative 1C.

Option 1VA—Interrupted Three-Lane Widening

Operational impacts under this alternative would be similar to those described for Alternative 1C.

Segment 2 – East Quimper Peninsula

Alternative 2A—No Action

Impacts under this alternative would be similar to those described for Alternative 1A.

Alternative 2B—Transportation Demand Management

Operational impacts under this alternative would be the same as those described for Alternative 1B.

Alternative 2C—Four-Lane Widening

Loss of riparian habitat associated with the Shine Creek watershed may affect wildlife and wetland functions and values through the loss of forest cover, organic matter, and increased fragmentation. While riparian vegetation may be planted as mitigation for project impacts, the benefits of these plantings would take several years to realize. Because the existing tributary is currently functioning as a drainage ditch, stream channel relocation away from the roadway may increase wetland buffers, further protecting this system. Due to stormwater treatment and detention measures where none currently existed, Alternative 2C is expected to result in long-term benefits to wetlands by reducing water quality and quantity impacts.

Alternative 2VA—Continuous Three-Lane Widening

Operational impacts under this alternative would be the same as those described for operational impacts common to all segments.

Segment 3 – Hood Canal Floating Bridge

Alternative 3A—No Action

Impacts under this alternative would be similar as those described for Alternative 1A.

Alternative 3B—Transportation Demand Management

No operational impacts would occur under this alternative.

Alternative 3C—Four-Lane Bridge Widening

The proposed bridge widening does not include stormwater treatment measures for the approach spans or the floating bridge sections. There is a potential for untreated chemicals originating from vehicles to enter the waterway, affecting aquatic beds (eelgrass) and the Hood Canal shoreline.

Segment 4 – Port Gamble Bay Area

Alternative 4A—No Action

Impacts under this alternative would be the same as those described for Alternative 1A.

Alternative 4B—Transportation Demand Management

Operational impacts under this alternative would be the same as those described for Alternative 1B.

Alternative 4C—Two-Lane Northern Bypass

Operation of a new roadway through the north bypass alignment would displace wildlife from the area and may reduce the value of the wetlands and stream corridors that remain between the proposed bypass route and the existing SR 104 corridor. As a result, wetland habitat diversity and structure in this area may decrease.

Due to the incorporation of stormwater treatment and detention measures where none currently exists, Alternative 4C is expected to result in long-term benefits to wetland water quality and quantity.

Alternative 4D—Two-Lane Southern Bypass

Loss of riparian forest associated with Todhunter Creek may reduce wildlife and wetland functions and values through the loss of forest cover, organic matter, and fragmentation of the riparian corridor. While riparian vegetation may be planted as mitigation for project impacts, the benefits of these plantings would take several years to realize.

Alternative 4VA—Upgrade Existing Two-Lane Roadway

Loss of trees along the Port Gamble Bay shoreline may result in increased erosion along the shoreline. Removing trees from this narrow buffer may render the remaining trees susceptible to windfall, further increasing erosion potential along the shoreline.

Loss of riparian forest associated with Todhunter and Gamble Creeks and unnamed drainages to Port Gamble Bay may affect wetland function and values through the loss of riparian forest cover and organic matter accumulation. While riparian vegetation may be planted as mitigation for project, the benefits of these plantings would take several years to realize.

Due to the incorporation of new stormwater treatment and detention measures, Alternative 4VA is expected to result in long-term benefits to wetland water quality and quantity.

Segment 5 – Greater Kingston

Alternative 5A—No Action

Impacts under this alternative would be the same as those described for Alternative 1A.

Alternative 5B—Transportation Demand Management

Operational impacts under this alternative would be the same as those described for Alternative 1B.

Alternative 5C—Four-Lane Widening

Operational impacts under this alternative would be the same as those described for operational impacts common to all segments. This segment has a higher degree of urban development than the other segments. Urban settings have higher degrees of disturbance associated with wetlands systems. Roadside litter, soil moving operations, and increased roadside vegetation clearing can further fragment wetland systems and wetland functions and values through the introduction of nonbiodegradable materials, increased soil erosion, and invasive species.

Loss of riparian habitat at stream crossings may affect wetland wildlife functions through the loss of stream shade, organic matter accumulation, and large woody debris recruitment. While riparian vegetation may be planted as mitigation for project impacts, the benefits of these plantings would take several years to realize.

Alternative 5D—Kingston Grade Separation

Operational impacts under this alternative would be the same as those described for operational impacts common to all segments.

Alternative 5E—Short Tunnel

Operational impacts under this alternative would be the same as those described for operational impacts common to all segments.

Mitigation Measures for Operational Impacts

The following mitigation measures are proposed to minimize operational impacts on wetlands in the study area.

- All cleared areas would be seeded and mulched with certified weed-free seed mix; riparian areas would be revegetated with native wetland species that provide good stream channel shading characteristics.
- Roadside vegetation clearing and the application of herbicides should be confined to roadside pull-offs for vehicle safety purposes and should not extend into wetland areas.
- The proposed action is expected to meet or exceed the requirements of the 2001 draft *Highway Runoff Manual* (WSDOT 2001a) and Instructional Letter 4020.01 (Endangered Species Act §7(d) Project List and Stormwater Effects Guidance [WSDOT 2001b]). Adherence to these requirements would minimize operational impacts to the maximum extent practical. Therefore, no additional mitigation for potential water quality impacts is required.

Cumulative Impacts

The proposed SR 104 improvements would promote additional development in Kitsap and Jefferson Counties. Increased development also would likely occur even under the no-action alternative. These developments would likely contribute to wetland acreage losses, functions, and values. Wetland protection for associated development projects would minimize these wetland impacts. Despite these requirements, some cumulative loss of wetland acreage, functions, and values would occur.

Mitigation Measures for Cumulative Impacts

Given that the proposed project is only at the planning level, few specific mitigation measures are discussed. Wetland-related permits and requirements would be required for future projects involving the filling or the alteration of functions in these systems. All future projects would adhere to county and state wetland requirements aimed at minimizing long-term wetland loss, wetland functions, and wetland values.